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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/649,771

08/28/2003

Norio Okada

N03409US

5847

21254

7590

05/17/2004

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EXAMINER

TSAL, H JEY

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n N .

10/649,771

Applicant(s)

OKADA ET AL.

Examiner

H.Jey Tsai

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 3/22/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) 5,22-29 and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-14,30 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Election/Restriction***

Applicant's election with traverse of claims 1-4, 6-7 and 9-14 in Paper filed on March 22, 2004 is acknowledged. The traversal is on the ground(s) that new claims 30-34 are generic to all species. This is not found persuasive because claims 31-33 contains species such as evaluation pads, fuse region and slit-like trench, etc, these species are mutually exclusive.

The requirement is still deemed proper and is therefore made FINAL.

Claims 5, 22-29, 31-33 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper filed on March 22, 2004.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 30, 34, 1-4 and 6-9, 13-14 are rejected under 35 U.S.C. § 102(e) as being anticipated by Komada 2002/0125577.

Komada discloses a semiconductor device, which includes:

a semiconductor chip C provided with a circuit formation portion comprising a plurality

wiring insulating films 46/47/52/53/57/58/59/60/65/66/67/68/73/74/75/76/81 stacked on top of each other in layers on a semiconductor substrate 40, figs. 3B, 4-8 and para. 73-121,

a multi-layer interconnection 51/55c/55r/63c/63r/71c/71r/79c/79r formed in said plurality of wiring insulating films 46/47/52/53/57/58/59/60/65/66/67/68/73/74/75/76/81,

wherein one or more wiring trenches are formed in each of said plurality of wiring insulating films along a periphery R (a Cu ring or fence), of said semiconductor chip in such a manner as to surround a specified region C (a circuit area) on the semiconductor substrate, para. 67, 73-78 and figs. 3-4, 5B, 6D, 7D,

wherein in each of the one or more wiring trenches, a conductive layer 55 made up of copper or a copper-based conductive material (Cu) is buried via a first copper diffusion preventing film (54r/62r/70r/78r, such as TaN), in such a manner that the respective wiring trenches corresponding to each other in the plurality of wiring insulating films are connected with each other upwardly or downwardly, fig. 4 and para. 77-78 and 92-94,

wherein a second copper diffusion preventing film 52/57/59/65/67/73/75/81 (a SiN, also is a stopping and blocking layer) is formed between each of plurality of wiring insulating films 46/47/52/53/57/58/59/60/65/66/67/68/73/74/75/76/81 and another one of said plurality of wiring insulating films 46/47/52/53/57/58/59/60/65/66/67/68/73/74/75/76/81 being adjacent thereto upwardly or downwardly, in such a manner as to be connected with the corresponding first copper diffusion preventing film 54r/62r/70r/78r,

at least one conductive layer 55/63 is connected to a diffusion area 42n, fig. 4,

at least one wiring insulating film is a low dielectric constant film 47, see para. 73,

ring comprises a single and dual damascene wiring structures, figs. 4-8 and para. 79, 97-98,

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12 are rejected under 35 U.S.C 103 as being unpatentable over Komada as applied to claims 30, 34, 1-4 and 6-9, 13-14 above, and further in view of Ibnabdeljalil et al. 2002/0024115.

The difference between the references applied above and the instant claim(s) is: Komada teaches a guard (seal) ring formed around a circuit region with single and dual damascene copper structures but does not show that guard (seal) ring is connected to a diffusion region. However, Ibnabdeljalil et al. teaches at fig. 2B, 3-4, 7B, 7C and 49, 56, 69 that guard (seal) ring 22c/23c is connected to a diffusion region 28 or 30a so as to match (fig. 3) or not match (fig. 4) the shape of seal ring.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings with a seal ring connecting to a diffusion region formed on the substrate as taught by Ibnabdeljalil et al. because unwanted charges accumulated on the seal ring can be drained to substrate through the diffusion region.

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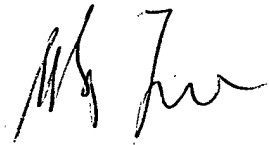
**Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the customer service whose telephone number is (703) 308-4357 and Fax number (703) 872-9306**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for this Group is (703) 872-9306.

hjt

5/12/04



H. Jey Tsai  
Primary Examiner  
Patent Examining Group 2800